

# A SYSTEMATIC LITERATURE REVIEW OF DIABETES-SPECIFIC QUALITY OF LIFE IN ASEAN

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## Abstract -

**Introduction:** Diabetes mellitus is notorious for its metabolic effect, acute and long-term complications and impact on Health-related Quality of Life (HRQoL).

**Objective:** The current systematic review was conducted to ascertain (1) the latest available information about HRQoL, (2) to discover the main methodological flaws in the studies of HRQoL, and (3) the main factors associated with HRQoL in people with diabetes.

**Methods:** National and international databases (Y hoc Thanh Pho Ho Chi Minh, Vietnam Journal of Preventive Medicine, Journal of Practical Medicine, Pubmed, Medline, Web of Science, CINAHL, Scopus, PsycINFO, ERIC, Google and Google Scholar) were searched following search terms: “diabetes”, “quality of life”, “đái tháo đường” and “chất lượng cuộc sống”. The data analysed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

**Results:** A total of 36 studies passed the inclusion criteria and were included in the review. The included studies were as follows: 18 studies from Malaysia, 9 studies from Singapore, 6 studies from Indonesia, 2 studies from Thailand, one study from Vietnam. Most studies investigated HRQoL among people with type 2 diabetes mellitus and 17 different instruments were used in the studies.

**Conclusion:** The growing interests over the last decade in evaluating HRQoL among people with diabetes were observed in ASEAN. The findings of this review showed that people with diabetes had a lower HRQoL than healthy people. The findings also indicated that better socioeconomic status, better control of risk factors and complications were associated with a better HRQoL among the patients with diabetes. Moreover, treatment adherence improved HRQoL. The reviewed studies suffered from major methodological and reporting flaws which limited the validity and generalization of their findings.

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**Key words:** Diabetes, quality of life, ASEAN, systemic literature review

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## I. INTRODUCTION

Due to insufficiency of traditional end points (which are mainly focused on biological and physiological outcomes) in capturing the effects of interventions on patients' HRQoL, a growing interest has emerged during the past decades for assessing the determinant factors of a patients' HRQoL, especially in chronic diseases [23][26]. Diabetes mellitus (DM) is notorious for its metabolic effect, acute and long-term complications and impact on QoL [10]. It is considered as one of the most common chronic diseases in nearly all countries, and its prevalence continues to increase mainly due to the changes in lifestyles resulting in physical inactivity, and increased obesity. It was estimated that diabetes affected 285 million adults (20–79 years) worldwide in 2010, and this figure will increase to 439 million adults by 2030 [40]. The prevalence of DM among the world's countries shows a wide range; 4.6% in Yemen, 9.3% of the total US population, and 10.7% in the United Arab Emirates. Regionally, Africa was found to have the lowest rate (2.4%), while the increasing prevalence of DM is expected for South East Asian countries and for Sub-Saharan Africa [11]. Diabetes is associated with the higher risk of some macro and microvascular complications. As a result, these complications cause the mortality rate among diabetic patients to be about twice as much as that of

non-diabetic individuals of a similar age. Moreover, patients with these complications have a lower HRQoL than diabetic patients without the complications [26]. Information about a patient's HRQoL is commonly gathered using 'Patient-Reported Outcome Measures' (PROMs) [23][47]. These involve the patient responding to a number of questions on themes such as physical functioning, social functioning and mental wellbeing, and may include both generic and disease-specific questions [23]. Diabetes is a life-long disease and a constantly increasing incidence of diabetes has drawn the attention of the healthcare community to the need for effective management programmes [5]. These studies aimed to improve the HRQoL in people with diabetes by providing evidence for informed decision-making. However, differences in the research questions, tools and population among these individual studies make it difficult to reach a clear answer applicable for policy making purposes. In response to this, conducting a systematic review of individual studies to make the available evidence more accessible for policy-making is common in medical researches [26]. In this course, the current systematic review was conducted to describe the latest available information about HRQoL in people with diabetes in ASEAN. Specifically, this review aimed to investigate how HRQoL was measured in the ASEAN diabetic population, what were the main

methodological flaws of these studies, and which factors were mainly associated with HRQoL in people with diabetes.

## II. METHODS

### 2.1. Literature search

A systematic literature search was independently conducted in January 2018 to review the studies which evaluated HRQoL among people with diabetes in ASEAN. The results of this literature search were independently verified and updated in February 2018. Studies published up to January 2018 were included in the review. National and international databases (Y hoc Thanh Pho Ho Chi Minh, Vietnam Journal of Preventive Medicine, Journal of Practical Medicine, Pubmed, Medline, Web of Science, CINAHL, Scopus, PsycINFO, ERIC, Google and Google Scholar[6][21]) were searched through following search terms: “diabetes”, “quality of life”, “đái tháo đường” and “chất lượng cuộc sống”. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[32].

### 2.2. Selection of studies

Five exclusion criteria were applied: (1) the study did not investigate HRQoL in people with diabetes, (2) the study did not provide any data about HRQoL among the study population (e.g., the study was related to instrument development in patients with diabetes); (3) the study was a review of articles; (4) the study was not a journal of articles (e.g., conference abstracts and dissertations); (5) the study was not applied to the populations of the countries of ASEAN. The initial search resulted in 506 documents. After excluding duplicates and non-relevant studies, 45 articles were selected for full text examination. The reference lists of these 45 documents were manually searched. In total, 36 publications were included for the review (Figure 1). In cases where multiple publications were produced from a single study, the paper with the most comprehensive data was included. Data extracted from the selected studies is as follows: year of publication, country and the year the studies were conducted, study design, sample size, type of diabetes, age range of the sample, duration of diabetes, the HRQoL measurement tool used, the main predictors of HRQoL, and statistical methods used for analysis.

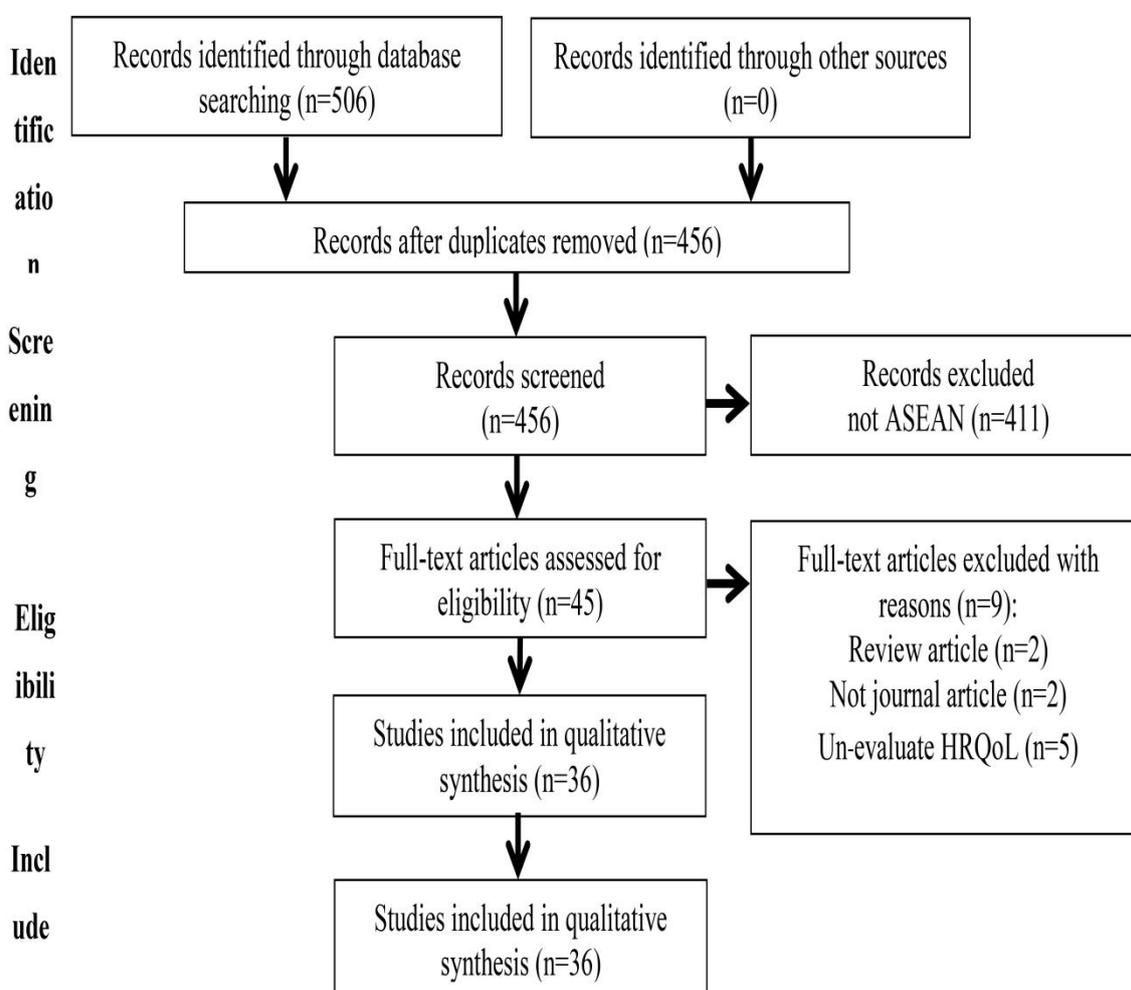


Figure 1. Flow diagram of the literature search

### 3.1. General characteristics

The characteristics of the 36 eligible studies for this review are shown in Table 1. The first study in Singapore was published in 2005, in 2008, however, a follow-up study was announced in Thailand. Then there were few publications per year on the topic, until 2013, when seven articles were published in 2015, 2016 and 2017 (Figure 2). HRQoL in people with diabetes was investigated in 5 of the 10 countries of the ASEAN. Among them, 18 out of 36 studies (50%) were conducted in Malaysia, while in Vietnam there was only one study (2.78%) (Figure 3). Sample sizes across the studies ranged from 12 to 5,224 participants.

The majority of the studies (97.22%) were published in an English language journal, only one of them appeared in a Vietnamese journal. Cross-sectional design was the dominant design in the studies ( $n=31$ ). In terms of type of diabetes, 31 studies covered only type 2 diabetic mellitus, yet non-study items included only people with type 1 diabetes. In the remaining studies, there were two combinations of type 2 diabetes and non-diabetic people in the sample. The age of participants ranged from 18 to 90 years old. In most studies, women constituted the majority of the study participants, specifically, two researches only analysed one female. The mean duration of diabetes in patients ranged from 4 to 14 years (Table 1).

### 3.2. Health-related quality of life instrument

Regarding the instrument used to measure HRQoL, in the study population, 17 different instruments were used in the studies. 16 studies used a generic measure, one study used two generic instruments, 16 studies employed a disease specific instrument and 4 studies

applied both generic and disease specific instruments, one study used two generic and one specific questionnaire. The EQ-5D was used in 8 researches. The SF-36 was used in 7 studies. The ADDQoL-19 was applied by 5 studies; DQLCTQ and WHOQOL-BREF were used by 3 studies; SF-12, SF-6D, ADDQoL-18, AsianDQOL and MENQOL were utilized by 2 studies; and each of the others used one study (Table 2).

### 3.3. HRQoL in diabetic vs non diabetic patients

Two studies, which examined the effect of diabetes on HRQoL, were specifically on menopausal women (Table 1). It compared HRQoL in people with and without diabetes and reported a negative association of type 2 diabetes on the HRQoL of menopausal women.

### 3.4. Diabetes-related complications

Nineteen studies examined the effects of diabetes-related complications on HRQoL in patients with diabetes. These researchers found that these complications had a negative effect on the HRQoL of diabetic patients.

### 3.5. Other predictors of HRQoL

The association between HRQoL and some demographic, socioeconomic and clinical predictors were examined on twenty nine studies. Among them, there are eighteen studies which found a negative association between age and HRQoL; however, seven investigations showed that it was non-significant. Moreover, 22 studies assessed gender and HRQoL of which 12 showed that females had a lower HRQoL than males, four studies showed the gender related QoL of diabetic patients was lower and others expanded non-significant. Also, there was a difference of HRQoL between ethnicities which was demonstrated in 12 studies. In addition, there were four researches which compared religion and HRQoL, but only three studies were significant. Only fourteen studies described the relationship between socioeconomic (including income, education, employment) and HRQoL while, there are seven studies which showed that the better the socioeconomic status the better the HRQoL. Others discussed why the quality of life of diabetics was not improving. The marital status of diabetics was analysed in 10 researches, and found to be unrelated to the HRQoL of diabetic people. However, two researches showed that the size of the family impinged on the HRQoL of a diabetic, and it improved if they lived in a large house. People with lower HbA1c (better glycaemic control) generally had a higher HRQoL (this showed in 16 studies). There was only one study which claimed negative associations between blood pressure and HRQoL. Similarly, a study confirmed that blood lipid decreased the quality of life of diabetic patients. In 8 studies a lower level of HRQoL was found among people a higher BMI. Eight studies found there was a negative association between HRQoL and the duration of the diabetes, four studies reported it to be unrelated. In general, there were thirteen studies which analysed the association between treatment and HRQoL which expanded to a mixed result as the major research found that HRQoL improved; however in one study, diet didn't change the HRQoL during treatment with insulin there was a lower decrease in HRQoL than with oral treatment, but the combined treatment showed the best improvement in HRQoL. In addition, in the four studies, adherence to therapy increased HRQoL.

Table 1 Characteristics of the studies included in the review										
First author (Published year)	Country	Language	Data year	Study design	Sample characteristics					HRQoL Instrument
					Type of diabetes (%)	Sample size	Age range	Female (%)	Diabetes duration (mean)	
D A Perwitasari(2017)	Indonesia	English	2017	Cross-sectional	Type 2 (100)	86	>18	57	7.31	EQ-5D
D. A. Perwitasari(2016)	Indonesia	English	NA	Cross-sectional	Type 2 (100)	65	NA	52.3	NA	DQLCTQ
Imaniar Noor Faridah (2017)	Indonesia	English	2016	Cross-sectional	Type 2 (100)	52	>18	75	NA	DQLCTQ
I N Faridah(2017)	Indonesia	English	2017	Cross-sectional	Type 2 (100)	80	>18	65	4.82	EQ-5D
Sofa D. Alfian(2016)	Indonesia	English	2014	Cross-sectional	Type 2 (100)	91	≥18	71	NA	D-39
Tri Murti Andayani (2010)	Indonesia	English	2007-2008	Observational prospective	Type 2 (100)	115	NA	49.57	12.53	DQLCTQ
Aqil M. Daher(2016)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	256	30-80	58.6	NA	ADDQoL-18
Aqil Mohammad Daher (2015)	Malaysia	English	2012	Cross-sectional	Type 2 (100)	256	30-80	58.6	NA	ADDQoL-18
Boon-How Chew (2015)	Malaysia	English	2012-2013	Cross-sectional	Type 2 (100)	700	≥30	52.8	6.5	WHOQOL-BREF
Boon-How Chew (2015)	Malaysia	English	2012-2013	Cross-sectional	Type 2 (100)	700	≥30	52.8	NA	WHOQOL-BREF
Kamarul Imran M (2010)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	150	≥18	42	NA	SF-36
Lee Lan Low(2014)	Malaysia	English	2012-2013	Cross-sectional	Type 2 (100)	12	50-62	58.33	8.7	In-depth interviews
Mohamad Adam Bujang (2017)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	290	≥18	49	NA	DQOL
Mohamed Mansor Manan (2014)	Malaysia	English	2012	Cross-sectional	Type 2 (100)	179	≥60	54.7	10.89	PAID
Mubashra Butt(2016)	Malaysia	English	2013-2014	RCT	Type 2 (100)	73	NA	57.6	NA	EQ-5D-3L
Mun Chieng Tan(2014)	Malaysia	English	2010-2011	Cross-sectional	Type 2 (100)	313	30-78	52.1	10.1	15D
S.G.K. Goh (2015)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	451	NA	37.9	14	AsianDQOL
S. G. K. Goh (2015)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	647	>18-80	34.6	4	AsianDQOL
Soraya Azmi (2018)	Malaysia	English	2015	Cross-sectional	Type 2 (100)	816	≥18	43.8	8.9	SF-36
S. S. Hasan (2014)	Malaysia	English	NA	Case-control	Type 2 NDM	640	35-75	100	NA	MENQOL SF-12
Syamimi Samah (2016)	Malaysia	English	2015	Cross-sectional	Type 2 (100)	202	≥18	70.8	7	DQoL-BCI
Syed Shahzad Hasan (2016)	Malaysia	English	2012-2013	Case-control	Type 2 NDM	640	27-70	100	NA	MENQOL
Zeinab Jannoo (2015)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	596	>18	47.6	9.66	ADDQoL-19
Zeinab Jannoo (2017)	Malaysia	English	NA	Cross-sectional	Type 2 (100)	497	25-85	46.3	9.97	ADDQoL-19 SF-36
Hwee-Lin Wee (2005)	Singapore	English	1998-1999	Cross-sectional	Type 1 Type 2	5,224	21-65	48.9	NA	SF-36 SF-6D
Joanne HM Quah(2011)	Singapore	English	2009	Cross-sectional	Type 2 (100)	699	>21	55.5	NA	EQ-5D
Michelle Ang Co(2015)	Singapore	English	NA	Cross-sectional	Type 2 (100)	213	21-64	36.6	9.3	ADDQoL-19
Ryan Eyn Kidd Man (2016)	Singapore	English	2010-2013	Cross-sectional	Type 1 Type 2	390	22-78	29.7	11.5	IVI
Shim YT(2012)	Singapore	English	2009	Cross-sectional	Type 2 (100)	301	≥21	48.9	NA	EQ-5D ADDQoL-19
Swapna K Verma(2010)	Singapore	English	2006-2007	Cross-sectional	Type 1 (3.6) Type 2 (96.5)	537	≥21	41.3	10.2	SF-36
Tan Luor Shyuan Maudrene (2014)	Singapore	English	2011-2013	Cross-sectional	Type 2 (100)	212	21-65	37	NA	WHOQOL-BREF
Tessa Riandini (2017)	Singapore	English	2014-2017	Cross-sectional	Type 2 (100)	160	40-79	41.9	13.37	EQ-5D-5L
Xu-Hao Zhang(2012)	Singapore	English	NA	Cross-sectional	Type 1 (26.47) Type 2 (73.53)	68	33-72	44.12	NA	ADDQoL-19 EQ-5D SF-6D
Nutchath Wichit (2017)	Thailand	English	NA	RCT	Type 2 (100)	140	≥35	75.7	6	SF-12
Phantipa Sakthong (2008)	Thailand	English	2007	Cross-sectional	Type 2 (100)	303	27-90	71	12.2	EQ-5D
Tran Ngoc Hoang (2014)	Vietnam	Vietnamese	2011	Cross-sectional	Type 2 (100)	200	NA	76.5	5.8	SF-36

## IV. DISCUSSION AND CONCLUSION

### 4.1. Discussion

To our knowledge, this is the first time, the current study has reviewed the results of 35 identified studies examining HRQoL among ASEAN patients with diabetes. The findings of this review showed that generally people with diabetes have a worse HRQoL than their healthy counterparts. In addition, the findings indicated that diabetes related complications have a significant negative impact on HRQoL among diabetic patients in ASEAN countries. In general, associations between covariates and HRQoL in the reviewed ASEAN studies were in line with their international counterparts. The reviewed studies suffer from major methodological and reporting flaws which affected the quality of their findings and limited their validity and generalizability. The reviewed studies mainly applied a non-random sampling method, which selected clinics, leading to possible selection bias. Moreover, calculation of sample size was unclear (a convenient sample) in the majority of the studies. Furthermore, while most studies were observational (only two randomized controlled trials), univariate analysis was the main statistical approach used for data analysis and minimum effort was made to control any imbalance in the covariates leading to potential confounder and selection biases. Among studies which employed multivariate analysis, some of the main confounding factors (such as diabetes-related complications and duration of diabetes) were not controlled raising the possibility of confounder bias. In addition, these studies didn't explain their limitations adequately and did not comment on the potential biases in their reported results. Although, generic instruments were used more than specific instruments, limitations of these instruments in capturing HRQoL in patients with diabetes were not fairly explained. Moreover, several studies failed to validate the instruments before putting them to use in a new population (particularly, IDI instrument on Lee Lan Low et al (2014) [27]) and only referred to application of the instruments in a diabetic population in other countries or a general population in the ASEAN countries (as MENQOL in the study of S. S. Hasan et al 2014 [19] and 2016 [20]). It seems that similar to few other settings, ASEAN researchers have used the instruments applied in other studies without worrying about their content. However, there were three studies which checked questionnaire before analysis of the HRQoL of diabetic patient (two in Singapore [31][50] and one in Malaysia [16]).

The results of the current review should be interpreted in the light of a few limitations. Firstly, although Vietnamese databases used in this review consisted of a majority of articles published nationally, there is a possibility that some studies may not be included in these databases. Secondly, as a wide range of instruments were used in the reviewed

studies and the transparency of reported results was limited, it was not possible to apply statistical methods such as meta-analysis to test the association between the covariates and HRQoL. Increasing the number of studies applying the same instruments and improving transparency of reporting results may make it possible to conduct a meta-analysis in future. The previous systematic reviews have focused mainly on evaluating and comparing the measurement properties of instruments used in examining HRQoL among diabetic patients. In a review of HRQoL studies among people with diabetes in Iran, Aliasgha A Kiadaliri et al (2013) found that diabetic people had a lower HRQoL than those people without diabetes and also older people, diabetes-related complications, lower socioeconomic status, being female and a weaker control of clinical risk factors were associated with lower HRQoL [26]. These findings are comparable with the findings of the current review.

## CONCLUSION

The growing interest in evaluating HRQoL among people with diabetes was observed in ASEAN over the last decade. The findings of this review showed that people with diabetes had a lower HRQoL than healthy people. The findings also indicated that better socioeconomic status, better control of risk factors and complications were associated with a better HRQoL among the patients with diabetes. Moreover, treatment adherence improved HRQoL. The reviewed studies suffer from major methodological and reporting flaws which limit the validity and generalization of their findings.

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